

THREE NEW SPECIES OF THE GENUS *BACTROCERA* MACQUART (DIPTERA, TEPHRITIDAE, DACINAE) FROM HAINAN, CHINA

LIN Ming-Guang^{1,2}, WANG Xing-Jian^{2,3}, ZENG Ling^{1*}

1. Laboratory of Insect Ecology, South China Agricultural University, Guangzhou 510642, China

2. Hainan Entry-Exit Inspection and Quarantine Bureau, Haikou 570311, China

3. Institute of Zoology, Chinese Academy of Sciences, Beijing 100101, China

Abstract This paper deals with the further result of an extensive fruit-fly survey and monitoring during 2005–2010 in Hainan of China, three new species of the genus *Bactrocera* Macquart, *B. (Bactrocera) variabilis* Lin et Wang, sp. nov., *B. (Bactrocera) pictipennis* Lin et Zeng, sp. nov. and *B. (Bactrocera) nigrifemorata* Lin et Wang, sp. nov., are described, illustrations of the new species are given. The type specimens are deposited in the Insect Museum, Center for Tropical Plant Quarantine, Hainan Entry-Exit Inspection and Quarantine Bureau, Haikou, China.

Key words Diptera, Tephritidae, Dacinae, *Bactrocera*, new species, Hainan, China.

The taxonomic revision of the genus *Bactrocera* Macquart from Hainan has been made and 14 species of the genus have been reported (Lin et al., 2005). The partial result of an extensive fruit-fly survey and monitoring during 2000–2004 in Hainan was reviewed by Lin et al. (2006). This paper deals with the further result of the project during 2005–2010 in Hainan of China, three new species are here described. The type specimens are deposited in the Insect Museum, Center for Tropical Plant Quarantine, Hainan Entry-Exit Inspection and Quarantine Bureau, Haikou, China. Morphological terminology generally follows McAlpine (1981) and Drew et al. (1998). Length of body and wing is measured in millimeters.

Bactrocera (Bactrocera) variabilis Lin et Wang, sp. nov. (Figs 1–4)

Description. Male, body length 5.5–6.8 mm; wing length 4.5–5.6 mm.

Head. Frons about 1.52 times longer than wide, slightly narrower than eye; orange-yellow with small brown to black spots around frontal and orbital setae. Lunule and vertex brown, ocellar triangle black. Face yellow with two medium sized oval black facial spots. Antennae orange-brown to brown, segment 3 about 2.4 times as long as segment 2; arista bare, black except orange-brown basally. Genae yellow to orange-yellow. Occiput red-brown, yellow along eye margins, occipital row with 5–7 fine black setulae. Head chaetotaxy: 2 frontal, 1 orbital, 1 inner vertical, 1 outer vertical and 1 genal setae.

Thorax. Scutum dull black with brown inside postpronotal lobes, around transverse suture and

behind lateral postsutural vittae; two broad parallel sided lateral postsutural yellow vittae ending behind intra-alar setae. Postpronotal lobes yellow. Pleura areas black except red-brown below postsutural lobes and yellow markings as follows: notopleural callus, anepisternal stripe, a small upper transverse spot on katepisternum, anatergite and katatergite. Scutellum yellow with a narrow black basal band; subscutellum red-brown to black, postnotum black. Thoracic chaetotaxy: 2 scutellar, 2 notopleural, 2 prescutellar acrostichal, 1 postsutural supra-alar, 1 postalar, 1 intra-alar, 1 anepisternal and 4 scapular setae. Wing hyaline in ground color; narrow fuscous costal band slightly overlapping vein R_{2+3} and expanding slightly across apex of vein R_{4+5} ; narrow fuscous anal streak ending at wing margin; cells bc and c colorless; supernumerary lobe of medium development. Legs yellow except pale brown bases of tibiae, mid tibiae each with an apical black spur.

Abdomen. Oval in shape, abdominal terga predominately orange-brown to red-brown with short lateral black band on anterior margin of tergum 3, sometimes with a narrow medial longitudinal black vitta on tergum 5 or over terga 3–5; a pair of oval dark brown shining spots on tergum 5; pecten present on tergum 3. Sternite 5 with a deep concavity on posterior margin.

Female. Unknown.

Holotype ♂, China, Hainan, Qionghai, 24 July 2010, attracted to methyl eugenol in guava orchard, ZHANG Yan. **Paratypes:** 14 ♂♂, same locality and date as holotype; 6 ♂♂, same locality as holotype, 11 Aug. 2010, attracted to methyl eugenol in guava

This study was supported by Department of Science and Technology, Hainan Province (090146).

* Corresponding author, E-mail: zengling@scau.edu.cn

Received 7 Mar. 2011, accepted 1 Sep. 2011.



Figs 1-4. *Bactrocera* (*Bactrocera*) *variabilis* Lin et Wang, sp. nov., ♂. 1. Male adult. 2-4. Abdomen, dorsal view.

orchard, WANG Yu-Juan; 4 ♂♂, Hainan, Chengmai, 9 Aug. 2010, attracted to methyl eugenol in papaya orchard, ZHOU Hui; 4 ♂♂, Hainan, Wenchang, 25 June 2010, attracted to methyl eugenol in wax-apple orchard, ZHANG Yan; 5 ♂♂, Hainan, Wenchang, 1 July 2010, attracted to methyl eugenol, ZHANG Yan.

Distribution. China (Hainan).

Attractant. Methyl eugenol.

Host. Unknown.

Etymology. The specific epithet comes from the Latin *variabilis*, "changeable", referring to the variability of the markings on the abdominal terga.

Remarks. This species is similar to *B.* (*Bactrocera*) *carambolae* Drew et Hancock from Thailand, Malaysia and Indonesia in possessing a pair of medium sided oval black spots on face, two broad parallel sided lateral postsutural vittae ending behind intra-alar setae, cells bc and c colourless, narrow fuscous costal band slightly overlapping vein R_{2+3} and expanding slightly across apex of vein R_{4+5} . It differs from the latter in having anal fuscous streak ending at wing margin, femora completely yellow and all tibiae yellow except pale brown bases, abdominal terga predominately orange-brown to red-brown, lacking dark fuscous markings on anterolateral corners of terga

4 and 5.

***Bactrocera* (*Bactrocera*) *pictipennis* Lin et Zeng, sp. nov. (Fig. 5)**

Description. Male, body length 5.0 – 6.2 mm; wing length 4.5 – 5.1 mm.

Head. Frons about 1.55 times longer than wide, slightly narrower than eye; yellow with brown around frontal and orbital setae and on anteromedial hump. Lunule and vertex brown, ocellar triangle black. Face yellow with two medium sized oval black facial spots. Antennae orange-brown, segment 3 about 2.5 times as long as segment 2; arista bare, fuscous except yellow basally. Genae yellow. Occiput yellow to orange-brown, yellow along eye margins, occipital row with 5 – 7 fine black setulae. Head chaetotaxy: 2 frontal, 1 orbital, 1 inner vertical, 1 outer vertical and 1 genal setae.

Thorax. Scutum black with brown around transverse suture, inside postpronotal lobes, outside and behind lateral postsutural vittae; two broad parallel sided lateral postsutural yellow vittae ending behind intra-alar setae. Postpronotal lobes yellow. Pleura areas black except red-brown below postsutural lobes and yellow markings as follows: notopleural callus, anepisternal stripe, a small upper transverse spot on katepisternum, anatergite and katatergite. Scutellum yellow with a narrow black basal band;

subscutellum and postnotum black. Thoracic chaetotaxy: 2 scutellar, 2 notopleural, 2 prescutellar acrostichal, 1 postsutural supra-alar, 1 postalar, 1 intra-alar, 1 anepisternal and 4 scapular setae. Wing hyaline in ground color; narrow fuscous costal band confluent with vein R_{2+3} and expanding distinctly across apex of vein R_{4+5} ; narrow fuscous anal streak ending at wing margin; cells bc and c colorless; supernumerary lobe of medium development. Legs yellow, femora with small brown spots apically on outer surfaces, apical 4 segments of tarsi pale brown; mid tibiae each with an apical black spur.

Abdomen. Oval in shape, abdominal terga entirely orange-brown to pale red-brown except for a yellow band across posterior margin of tergum 2 and a pair of red-brown shining spots on tergum 5; pecten present on tergum 3. Sternite 5 with a deep concavity on posterior margin.

Female. Unknown.

Holotype ♂, China, Hainan, Qionghai, 6 July 2010, attracted to methyl eugenol in guava orchard, ZHANG Yan. Paratypes: 1 ♂, same locality and date as holotype; 1 ♂, same locality as holotype, 29 Aug. 2010, attracted to methyl eugenol in guava orchard,

ZHANG Yan.

Distribution. China (Hainan).

Attractant. Methyl eugenol.

Host. Unknown.

Etymology. This specific epithet combines the Latin *pictus*, "painted" or "colored", with *pennis* "wing", referring to the picture wing.

Remarks. This species is similar to *Bactrocera* (*Bactrocera*) *bimaculata* Drew et Hancock from Indonesia in possessing a pair of medium sided oval black spots on face, two broad parallel sided lateral postsutural vittae ending behind intra-alar setae and with small dark fuscous spots on apices of all femora. It differs from the latter in having the narrow costal band expanding distinctly across apex of vein R_{4+5} , abdominal terga completely orange-brown to pale red-brown except for yellow band across posterior margin of tergum 2 and red-brown shining spots on tergum 5.

Bactrocera (*Bactrocera*) *nigrifemorata* Lin et Wang, sp. nov. (Fig. 6)

Description. Male, body length 6 mm; wing length 5 mm.



5



6

Fig. 5. *Bactrocera* (*Bactrocera*) *pictipennis* Lin et Zhen, sp. nov., ♂.

Fig. 6. *Bactrocera* (*Bactrocera*) *nigrifemorata* Lin et Wang, sp. nov., ♂.

Head. Frons about 1.56 times longer than wide, slightly narrower than eye; orange-yellow. Ocellar triangle and vertex dark brown to black. Lunule orange-yellow. Face orange-yellow with a broad transverse black band across oral margin. Antennae orange-brown to brown, segment 3 about 2.65 times as long as segment 2; arista bare, black except pale brown basally. Genae orange-yellow. Occiput dark brown to black, yellow along eye margins, occipital row with 4–6 fine black setulae. Head chaetotaxy: 2 frontal, 1 orbital, 1 inner vertical, 1 outer vertical and 1 genal setae.

Thorax. Scutum dull black with two parallel sided lateral postsutural yellow vittae ending behind intra-alar setae. Postpronotal lobes yellow. Pleura black, yellow markings as follows: notopleural callus, anepisternal stripe, a small upper transverse spot on katepisternum, anatergite and katatergite. Scutellum yellow with a narrow black basal band; subscutellum and postnotum black. Thoracic chaetotaxy: 2 scutellar, 2 notopleural, 2 prescutellar acrostichal, 1 postsutural supra-alar, 1 postalar, 1 intra-alar, 1 anepisternal and 4 scapular setae. Wing hyaline in ground color; narrow fuscous costal band confluent

with vein R_{2+3} and expanding slightly across apex of vein R_{4+5} ; narrow fuscous anal streak ending at wing margin; cells bc and c colorless; supernumerary lobe of medium development. Legs entirely black except for basal 2/5 of hind femur and all tarsi yellow; mid tibiae each with an apical black spur.

Abdomen. Round in shape, entirely black except for small red-brown spot on medial apex of tergum 5; tergum 3 as long as tergum 4, tergum 5 about 1.3 times as long as tergum 4; pecten present on tergum 3. Sternite 5 with a deep concavity on posterior margin.

Female. Unknown.

Holotype ♂, China, Hainan, Haikou, 26 Oct. 2006, attracted to protein bait, XU Nan-Fang.

Distribution. China (Hainan).

Attractant. Protein bait.

Host. Unknown.

Etymology. The specific epithet combines the Latin *nigra*, "black", with *fermora*, referring to the black femora.

Remarks. This species is differentiated from all other *Bactrocera* by having a broad transverse black band on face, scutum dull black with two lateral postsutural yellow vittae ending behind intra-alar setae; narrow fuscous costal band confluent with vein R_{2+3} and expanding slightly at apex of wing; all femora black except basal 2/5 of hind femur yellow; abdomen round in shape, entirely black except for a small red-brown spot on medial apex of tergum 5.

REFERENCES

- Drew, R. A. I. 1989. The tropical fruit flies (Diptera: Tephritidae) of the Australasian and Oceanian Region. *Mem. Queensland Mus.*, 26: 1–521.
- Drew, R. A. I. and Hancock, D. L. 1994. The *Bactrocera dorsalis* complex of fruit flies (Diptera: Tephritidae: Dacinae) in Asia. *Bull. Entomol. Res.*, 2 (Suppl.): 1–68.
- Drew, R. A. I., Hancock, D. L. and White, I. M. 1998. Revision of the tropical fruit flies (Diptera: Tephritidae: Dacinae) of South-east Asia, II. *Dacus* Fabricius. *Invert. Tax.*, 12: 567–654.
- Hardy, D. E. 1973. The fruit flies (Tephritidae, Diptera) of Thailand and bordering countries. *Pacific Ins. Monogr.*, 31: 1–353.
- Hardy, D. E. 1974. The fruit flies of the Philippines (Diptera: Tephritidae). *Pacific Ins. Monogr.*, 32: 1–266.
- Hardy, D. E. 1982. The Dacini of Sulawesi (Diptera: Tephritidae). *Trebia*, 28: 173–241.
- Hardy, D. E. 1983. The fruit flies of the genus *Dacus* Fabricius of Java, Sumatra and Lombok, Indonesia (Diptera: Tephritidae). *Trebia*, 29: 1–45.
- Lin, M-G, Wang, X-J, Li, W-D, Xu, W and Chen, X-L 2005. Taxonomic revision of the genus *Bactrocera* Macquart from Hainan, with descriptions of two new species (Diptera, Tephritidae, Dacinae). *Acta Zootax. Sinica*, 30 (4): 842–847. [动物分类学报]
- Lin, M-G, Yang, Z-J, Wang, X-J, Li, J-Y and Li, W-D 2006. A taxonomic study of the subfamily Dacinae (Diptera: Tephritidae) from Hainan, China. *Acta Entomol. Sinica*, 49 (2): 310–314.
- McAlpine, J. F. 1981. Monograph and Terminology-adults. In: McAlpine, J. F., Peterson, B. V., Shewell, G. F., Teskey, H. J. and Wood, D. M. (eds.), *Manual of Nearctic Diptera*. Monograph. No. 27, Vol. 1, 9–63.
- Wang, X-J 1996. The fruit flies (Diptera, Tephritidae) of the East Asian Region. *Acta Zootax. Sinica*, 21 (Suppl.): 1–338, 265 figs, 41 pls. [动物分类学报]
- Wang, X-J and Zhao, M-Z 1989. Notes on the genus *Dacus* Fabricius in China with descriptions of five new species (Diptera, Tephritidae). *Acta Zootax. Sinica*, 14 (2): 209–219. [动物分类学报]
- Wang, X-J, Xiao, S, Chen, X-L, Long, R and Zhang, C-L 2008. Two new species of the genus *Bactrocera* Macquart (Diptera, Tephritidae, Dacinae) from Ruili, Yunnan. *Acta Zootax. Sinica*, 33 (1): 73–76. [动物分类学报]
- White, I. M. and Elson-Harris, M. M. 1994. Fruit Flies of Economic Significance: Their Identification and Bionomics. CABI International & ACIAR, Wallingford. 601 + IV pp.

中国海南果实蝇属三新种记述 (双翅目, 实蝇科, 寡鬃实蝇亚科)

林明光^{1,2} 汪兴鉴^{2,3} 曾玲^{1*}

1. 华南农业大学昆虫生态研究室 广州 510642

2. 海南出入境检验检疫局 海口 570311

3. 中国科学院动物研究所 北京 100101

摘要 系2005~2010年海南省实蝇监测和野外调查的部分研究结果, 记述实蝇科 Tephritidae 果实蝇属 *Bactrocera* Macquart 3新种, 并附其形态特征图。模式标本保存于海南出入境检验检疫局热带植物隔离检疫中心昆虫标本馆。

异色果实蝇, 新种 *B. (Bactrocera) variabilis* Lin et Wang, sp. nov. (图1~4)

本种与分布于泰国、马来西亚和印度尼西亚的杨桃果实蝇 *B. (Bactrocera) carambolae* Drew et Hancock 相似, 与后者的主要区别为翅的暗褐色臀条伸至翅缘; 足股节完全黄色, 胫

节除基部淡褐色外余全黄色; 腹部背板主要呈橙褐色至红褐色, 第4~5背板的前侧角无深褐色斑纹。

正模 ♂, 海南省琼海, 2010-07-24, 番石榴园内甲基丁香酚诱捕, 张艳采。副模: 14 ♂♂, 同正模; 6 ♂♂, 地点同正模, 2010-08-11, 番石榴园内甲基丁香酚诱捕, 王余娟采; 4 ♂♂, 海南省澄迈, 2010-08-09, 番木瓜园内甲基丁香酚诱捕, 周慧采; 4 ♂♂, 海南省文昌, 2010-06-25, 莲雾园内甲基丁香酚诱捕, 张艳采; 5 ♂♂, 海南省文昌, 2010-07-01, 甲基丁香酚诱捕, 张艳采。

词源: 新种种名源自该种腹部背板色斑的变异。

* 通讯作者, E-mail: zengling@scau.edu.cn

斑翅果实蝇, 新种 *B. (Bactrocera) pictipennis* Lin et Zeng, sp. nov. (图5)

本种与产自印度尼西亚的二斑果实蝇 *B. (Bactrocera) bimaculata* Drew et Hancock 相近, 与后者的区别主要为翅前缘带于 R_{4+5} 脉末端明显宽大; 腹部除第2背板后缘的1黄色横带和第5背板的红褐色腺斑外, 余全橙褐色至淡红褐色。

正模 ♂, 海南省琼海, 2010-06-06, 番石榴园内甲基丁香酚诱捕, 张艳采。副模: 1♂, 同正模; 1♂, 地点同正模, 2010-08-29, 番石榴园内甲基丁香酚诱捕, 张艳采。

词源: 新种种名源自该种的翅斑。

关键词 双翅目, 实蝇科, 寡鬃实蝇亚科, 果实蝇属, 新种, 海南, 中国。

中图分类号 Q969.456.8

黑股果实蝇, 新种 *B. (Bactrocera) nigrifemorata* Lin et Wang, sp. nov. (图6)

本种区别于属内其他种的鉴别特征如下: 颜具1黑色宽横带; 盾片黑色, 缝后黄色侧条的后端终止于翅内鬃之后; 翅前缘带狭, 宽至 R_{2+3} 脉并于翅端略加宽; 足股节除后对基部的2/5为黄色外, 余全黑色; 腹部呈圆形, 几全黑色, 仅第5背板中间末端有1红褐色小斑。

正模 ♂, 海南省海口, 2006-10-26, 蛋白饵诱捕, 徐南芳采。

词源: 新种种名源自该种足的股节黑色。